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ABSTRACT

This document illustrates one approach to the preparation of an instructional program budget and how it might be used to enhance the allocation of scarce resources in higher education. The ideas presented here are intended only as an introduction and will provide the reader with a brief overview of program budgeting as the term is currently used at the National Center for Higher Education Management Systems (NCHEMS). The examples shown draw upon information that will be generated by forthcoming NCHEMS cost simulations models, particularly the Resource Requirements Prediction Model (RRRM) 1.6. This booklet focuses only on an institution's direct instructional expenditures. No costs for activities such as research, libraries, student counseling, physical plant operations, or academic administration are reflected in either the organizational unit line-item budgets or in the instructional program budgets illustrated. (Author)

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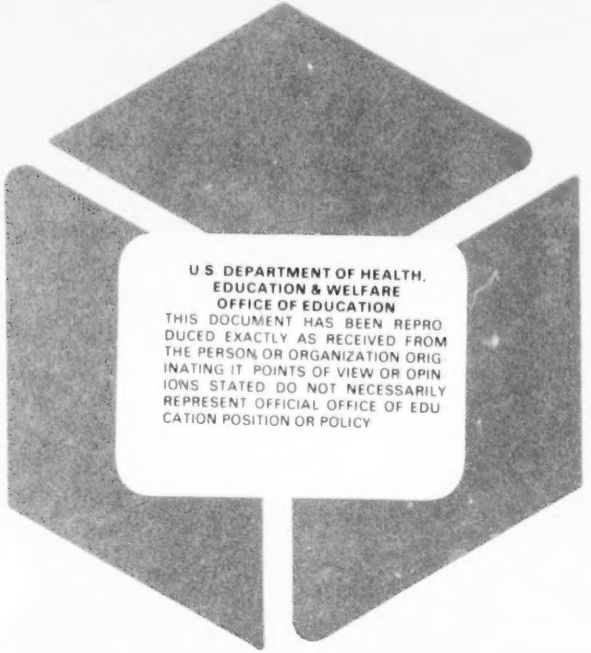
Instructional Program Budgeting in Higher Education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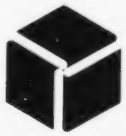

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- provide improved information to higher education administration at all levels.
- facilitate exchange of comparable data among institutions.
- facilitate reporting of comparable information at the state and national levels.

INSTRUCTIONAL PROGRAM BUDGETING IN HIGHER EDUCATION

David G. Clark
Robert A. Huff

September 1972

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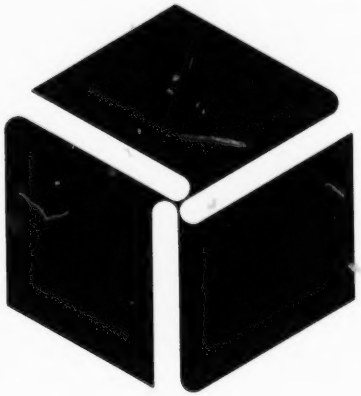

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INTRODUCTION

Observers of higher education have frequently noted that colleges and universities have often failed to plan effectively. Too often, it is agrued, institutions have developed programs in response to available funds without sufficient regard for the relationship of those programs to the overall goals of the institution. But for many institutions rapid growth during the past two decades made comprehensive, integrated planning difficult, if not impossible. The problem often was not where the funds would come from, but rather how to meet the educational needs of everincreasing numbers of students.

That period of growth has passed. Colleges and universities are being called upon to demonstrate their effectiveness and efficiency in relation to other public and private organizations and institutions. Demands from many sources call for "outcome-oriented planning" incorporating a program budget approach. In response to these demands for "accountability" in higher education, the concepts of planning and management systems have received considerable attention. Indeed, some states are requiring the implementation of those systems and the preparation of program budgets as the basis for all future state funding to higher education.

While the demand for higher education program cost information has increased, considerable disagreement remains over what a "program budget" is and how it is prepared. In the simplest terms, a program budget indicates the resources that are allocated to programs in order to achieve certain predetermined or desired outcomes. Three important words dominate this description--resources, programs, and outcomes. Resources are typically construed to mean dollars, although faculty, facilities, and equipment, are also resources for purposes of program budgeting. Programs are most often thought of in terms of the instructional function, but equally important are such other activities as research, student counseling, and housing, in relation to specific programs. Finally, outcomes are typically stated in terms of students trained, hours produced, or degrees granted. In reality, however, outcomes are much broader and may be measured in terms of individuals employed in their field of training, students admitted to graduate schools, individuals certified for practice in professional fields, skills acquired, and so on.

Many questions about the usefulness of program budget information for statewide and institutional planning and management in higher education are yet unanswered, but indications are that program budget information will become more important to college and university planners. Experience alone will conclusively resolve the questions about its usefulness.

This document illustrates one approach to the preparation of an instructional program budget and how it might be used to enhance the allocation of scarce resources in higher education. The ideas presented here are intended only as an introduction and will provide the reader with a brief overview of "program budgeting" as the term is currently used at the National Center for Higher Education Management Systems. The examples shown draw upon information that will be generated by forthcoming NCHEMS cost simulation models, particularly the Resource Requirements Prediction Model (RRPM) 1.6. This booklet will focus only upon an institution's direct instructional expenditures. No costs for activities such as research, libraries, student counseling, physical plant operations, or academic administration will be reflected in either the organizational unit line-item budgets or in the instructional program budgets illustrated.

Before considering program budgeting per se, it may be helpful to define the word "program" in the context of this document. Historically, colleges and universities have often used "program" to describe the activities of a specific instructional department within the institution. For example, the "history program" alluded to all the activities of the history department and the instructional process related to teaching history courses to all types of students.

In the following pages, "program" will be used to identify the activities and resources contributing to the education of a group of students pursuing a common curricular path.* Thus, within the history program a number of students are taking courses not only in history, but also in such other departments as biology, fine arts, business. The instructional services from all departments that teach history majors, then, form the history program. Programs may be further specified by level of student, e.g., lower division, upper division, and graduate division. The history

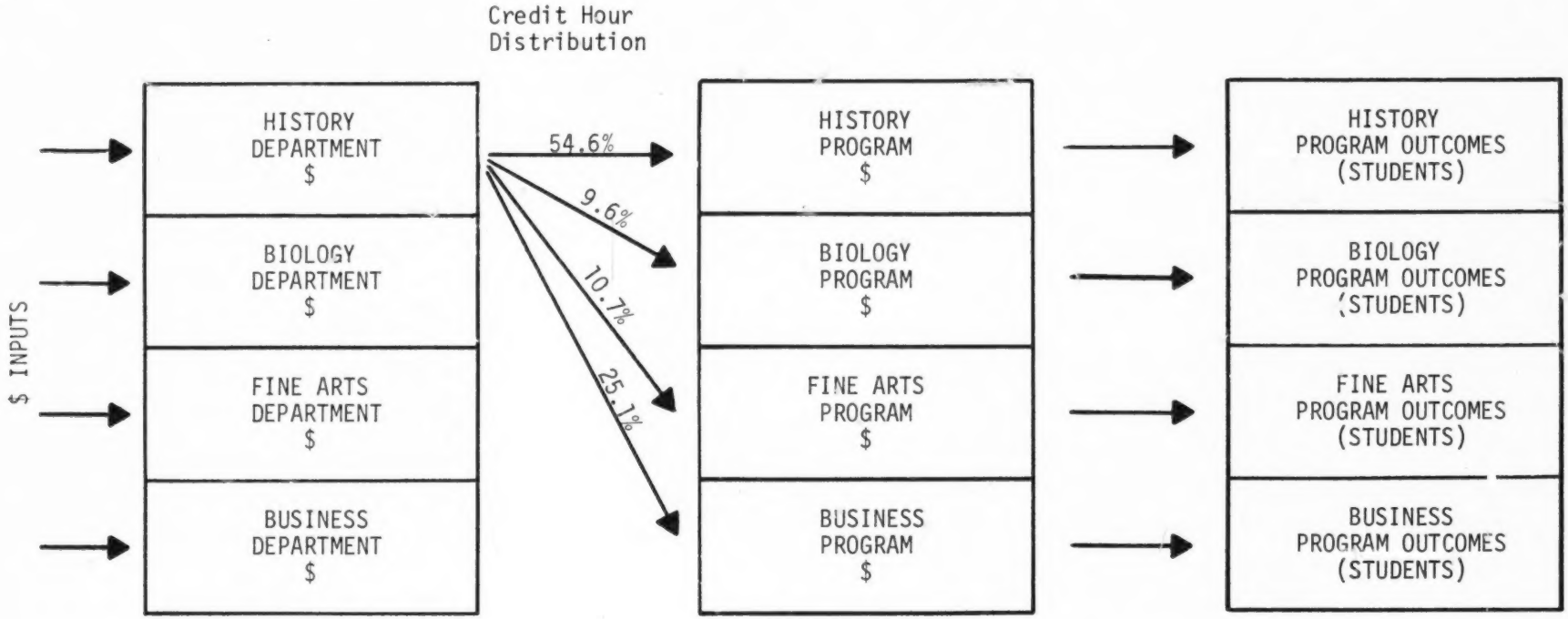
program would, therefore, be divided into three components with each component reflecting the activities and resources from the various instructional departments that contributed to the attainment of program outcomes of a specific group of history students.

An instructional department is defined as an organizational unit that contributes to the programs of the institution. It is not a program in and of itself, but rather it provides services in the form of teaching activities to the different programs. The unit measure of a department's output is usually the credit hour although other unit measures might be used, e.g., contact hours, courses. All of the department's instructional activities--and hence the credit hours generated by it--contribute to one program or another.

Program budgeting is a relatively new art in higher education. With experience, it seems certain that many improvements in current techniques will be developed. This document describes one tentative step along a lengthy path. As is so frequently the case, in program budgeting the greatest progress will result from learning by doing.

*See Appendix for further discussion.

THE CONCEPT OF AN INSTRUCTIONAL PROGRAM BUDGET



THE CONCEPT OF AN INSTRUCTIONAL PROGRAM BUDGET

"Program budgeting" for an institution can be defined in several ways. Underlying the NCHEMS definition of a program budget is a description of the relationship of instructional departments to instructional programs within the institution. Traditionally, institutions have planned and budgeted on the basis of inputs to departments in the form of dollars, faculty and staff, physical facilities, etc. Relatively little reference was made to the outcomes of the programs those departments support. Thus, resource requests in traditional budgets have failed to link costs to program outcomes.

An instructional program budget is based upon the contributions of various instructional departments to specific programs. That is, program costs are determined by the flow of credit hour costs from the instructional departments to programs.

The figure above indicates that credit hours flow from the history department to the four programs shown in the center of the page. The history department may be viewed as contributing credit hours--and hence resources--to the history program, the biology program, the fine arts program, and the business program.

It is important to note that the measure of program outcomes is stated here in terms of the number of students in a given program. It would be highly desirable to have additional outcome information indicating the quality of instructional programs, their value to the student and to society. However, such outcome measures have been notably elusive. This is an area currently being investigated by the Research Unit at NCHEMS. For the present, program outcomes will be considered in terms of the number of students enrolled in various programs at different student levels, e.g., freshman, sophomore, junior, senior, graduate students. Thus, linking instructional costs to program outcomes currently must be accomplished by defining the cost per student in various programs.

TWO VIEWS OF AN INSTRUCTIONAL PROGRAM BUDGET

ORGANIZATIONAL UNIT LINE-ITEM BUDGET

For Daily Execution and Control
Of Organizational Units

Department of History	$397,260
Department of Biology	$574,351
Department of Fine Arts	$341,136
Department of Business	$464,765

INSTRUCTIONAL PROGRAM BUDGET

For Institutional Planning And
Decision Making

History Program	$409,602
Biology Program	$467,355
Fine Arts Program	$215,453
Business Program	$685,102

$1,777,512 ◄——— TOTAL BUDGETS ARE EQUAL ———► $1,777,512

TWO VIEWS OF AN INSTRUCTIONAL BUDGET

"Program budgeting" assumes two views of an instructional budget that are interrelated and of equal importance. One is the traditional organizational unit line-item budget, and the other is the program budgeting itself.

A program budget is a summation of the resource contributions of organizational units to the various programs. It provides information for planning and decision-making purposes. For example, an instructional program budget for the history program would indicate the resources (dollars) contributed from each of the four organizational units or instructional departments illustrated here.

A line-item budget, by contrast, is used for daily execution and control purposes within organizational units. It focuses upon the activities within a single department or college, for example, without regard to the programs to which those activities contribute.

Note that the total direct instructional costs for the four instructional departments is equal to the sum of the direct instructional costs shown for the four programs. This is so because the cost information in the organizational unit line-item budget has simply been reaggregated to reflect the flow of resources from the instructional departments to the programs.

TWO VIEWS OF AN INSTRUCTIONAL PROGRAM BUDGET: AN EXAMPLE

Organizational Unit Line-Item Budget for Execution and Control

History Department	
Academic Salaries	$ 349,087
Support Staff Salaries	35,733
Supplies and Expenses	4,428
Equipment	2,864
Other Expenses	5,148
TOTAL	$ 397,260
Biology Department	
Academic Salaries	$ 495,365
Support Staff Salaries	59,629
Supplies and Expenses	7,232
Equipment	4,609
Other Expenses	7,516
TOTAL	$ 574,351
Fine Arts Department	
Academic Salaries	$ 299,778
Support Staff Salaries	24,935
Supplies and Expenses	7,808
Equipment	3,974
Other Expenses	4,641
TOTAL	$ 341,136
Business Department	
Academic Salaries	$ 418,892
Support Staff Salaries	32,888
Supplies and Expenses	2,889
Equipment	2,985
Other Expenses	7,111
TOTAL	$ 464,765

TOTAL DIRECT INSTRUCTIONAL COST - $1,777,512

54.6% - $216,904

9.6% - $38,137

10.7% - $42,507

25.1% - $99,712

Instructional Program Budget for Planning and Decision Making

History Program	
Lower Division	$ 111,327
Upper Division	209,656
Graduate Division	88,619
TOTAL	$ 409,602
Biology Program	
Lower Division	$ 141,340
Upper Division	184,041
Graduate Division	141,974
TOTAL	$ 467,355
Fine Arts Program	
Lower Division	$ 83,918
Upper Division	88,487
Graduate Division	43,048
TOTAL	$ 215,453
Business Program	
Lower Division	$ 153,619
Upper Division	301,973
Graduate Division	229,510
TOTAL	$ 685,102

TOTAL DIRECT INSTRUCTIONAL COST - $1,777,512

TWO VIEWS OF AN INSTRUCTIONAL BUDGET: AN EXAMPLE

Instructional departments contribute to programs by providing instruction to students in different fields of study. To determine the direct instructional costs of programs, it is necessary to analyze how each department contributes to each program.

In the example shown here for the history department, it was possible to determine--through an analysis of the flow of credit hours into the different programs--that 54.6% of the history department line-item budget should be distributed to the history program, 9.6% to the biology program, 10.7% to the fine arts program, and 25.1% to the business program. Although not shown here, the 54.6% or $216,904 distributed to the history program would be broken down and further distributed as follows:

$ 32,615	Lower Division History Program
111,919	Upper Division History Program
72,370	Graduate Division History Program

Similar analyses were undertaken for each of the three remaining departments and their dollar costs were distributed accordingly across the four programs. After the dollars were distributed from each instructional department across the programs, those distributions to each program were summed to determine the total instructional cost of each program by level of student.

USERS OF INSTRUCTIONAL PROGRAM BUDGET INFORMATION

State Executive and Legislature	Objective:	Establish Overall State Priorities and Determine Level of Funding for Higher Education.
Statewide Higher Education Planning Board	Objective:	Determine Mix, Location, and Size of Programs. Review Basic Institutional Planning Parameters.
Institution	Objective:	Plan Curriculum Content, Design, and Requirements. Set Instruction Mode Guidelines.
Department	Objective:	Plan Course Offerings and Requirements. Allocate Resources to Specific Courses.

USERS OF INSTRUCTIONAL PROGRAM BUDGET INFORMATION

Program budget information could profitably be used in the planning process at at least four levels of decision making. The extent to which such information is actually utilized will depend largely upon its availability. It will also depend upon the extent to which instructional program budget information can be meaningfully compared with program budget information from other sources. For example, an instructional program budget for higher education may be of greatest value at the legislative level if it can be compared with program budgets for health care programs, primary and secondary education programs, and so forth.

Decision makers at the state executive and legislative level are primarily concerned with establishing overall state priorities for numerous activities and services (e.g., highways, welfare, education) and then determining the level of support for higher education as well as many other activities. The focus at this level will be upon the extent of funding for higher education with some reference to the kinds and extent of programs to be offered by institutions.

At the statewide educational planning level, the emphasis is placed upon the mix, locations, and size of higher education programs within the state. Statewide planners are generally concerned with rationalizing the programs among the various campuses and avoiding needless duplication. While some attention may be given to such basic institutional planning parameters as class section sizes, faculty workloads and the like, the primary concern is with the placement of programs on specific campuses and with the size and total cost of those programs.

The focus on a specific campus is upon defining the curriculum content for authorized programs, determining the relationship of the instructional departments to each program, and setting guidelines for the modes of instruction within the departments.

The instructional departments must plan specific course offerings and requirements and then allocate faculty, dollar, and facilities resources to them. Moreover, the departments will typically be concerned with such other activities as research and public service, all of which will draw upon the departments' resources.

Concern is sometimes expressed about the danger of having higher-level decision makers impose decisions upon individual institutions. Some individuals fear that the development of program cost information with supporting institutional data will result in statewide planning boards or legislatures dictating how the institutions (or even the instructional departments) will be run. Although the potential for decision making across different levels does exist, most statewide planning staffs and state legislators indicate that they do not seek direct involvement with the internal operations of the colleges or universities. Rather, they wish to be assured that the institutions are being well managed and that resources are being effectively allocated to programs that serve institutional and state goals for higher education.

FOUR STEPS IN BUILDING AN INSTRUCTIONAL PROGRAM BUDGET

1. Forecast Enrollments for Each Program.

2. Determine the Credit Hours Those Students Will Require in Each Instructional Department.

3. Calculate the Operating Costs for Each Instructional Department.

4. Distribute the Departmental Cost to the Programs.

BUILDING AN INSTRUCTIONAL PROGRAM BUDGET

Four basic steps lead to an instructional program budget as it has been conceived at NCHEMS.

1. Set admissions policies or otherwise forecast enrollments in various programs. For example, how many students will be admitted to a doctoral program in biology? How many students will enter the lower division business program? How many students should enter the advanced or upper division fine arts program?

2. Determine for each instructional department the credit hours a given mix of students in various programs will require of it. That is, the total number of credit hours demanded or taken by a given mix of students in various programs must be estimated and the credit hour production for each department must be specified.

3. Calculate the faculty salaries, support staff salaries, and other costs associated with generating the required number of credit hours in each department. This information essentially defines how the department shall operate.

4. Allow departmental costs to flow to program cost centers in proportion to the flow of credit hours from instructional departments to programs. This step is simply the conversion of organizational unit line-item accounting information to program cost information.

Once these tasks have been completed, an instructional program budget can be prepared. Several analytical tools have been developed at the National Center for Higher Education Management Systems that will aid in the four steps listed above. (See: Robert A. Huff and Charles W. Manning, Higher Education Planning and Management Systems -- A Brief Explanation [Boulder, Colo.: Western Interstate Commission for Higher Education, 1972].) Chief among the available tools helpful during instructional program budget development is the Resource Requirements Prediction Model (RRPM).

ANALYSES UNDERLYING INSTRUCTIONAL PROGRAM BUDGET DEVELOPMENT

Changes in Enrollment Patterns

Alternative Instruction Modes

Curriculum Changes

Alternative Staffing Patterns and Salary Schedules

Changes in Faculty Workloads

Variations in Levels of Support Activities

Long-Range Implications of Current Decisions

Trend Analysis

ANALYSES UNDERLYING INSTRUCTIONAL PROGRAM BUDGET DEVELOPMENT

When an instructional program budget is prepared by an institution, a number of assumptions must be made as to how each instructional department will be operated. Average class size, faculty workload, faculty salaries, the number of support staff, the level of expenditures for equipment, supplies and miscellaneous items, etc., will, along with the student demand for credit hours, determine the amount of resources required by each department. The use of a computational tool such as the NCHEMS Resource Requirements Prediction Model permits a variety of analyses with respect to different departmental and institutional operating characteristics (parameters).

Some of the kinds of analyses that might be done include an assessment of the human and financial resource implications of the following changes:

1. Enrollment Patterns
   - Increasing upper division fine arts enrollment by 10 percent
   - Decreasing graduate biology enrollment by 25 percent
   - Increasing lower division business enrollment by fifty students and concurrently decreasing lower division history enrollment by fifty students

2. Instruction Modes
   - Requiring all senior students to undertake field research projects
   - Adding tutorial sessions to existing courses in the history department
   - Initiating TV instruction for certain core courses

3. Curriculum
   - Dropping the lower division foreign language requirements for all students
   - Establishing interdisciplinary course requirements for certain majors
   - Reducing departmental course requirements for social science majors from 48 to 42 hours

4. Staffing Patterns and Salary Schedules
   - Increasing the proportion of junior faculty teaching at the institution
   - Increasing faculty and staff salary schedules by 10 percent
   - Reducing the number of teaching assistants as a result of a declining enrollment in graduate programs

5. Faculty Workloads
   - Increasing the weekly faculty contact hour load for lower division teaching
   - Decreasing class sizes at the graduate level
   - Increasing the required credit hour production to a specified level for full professors

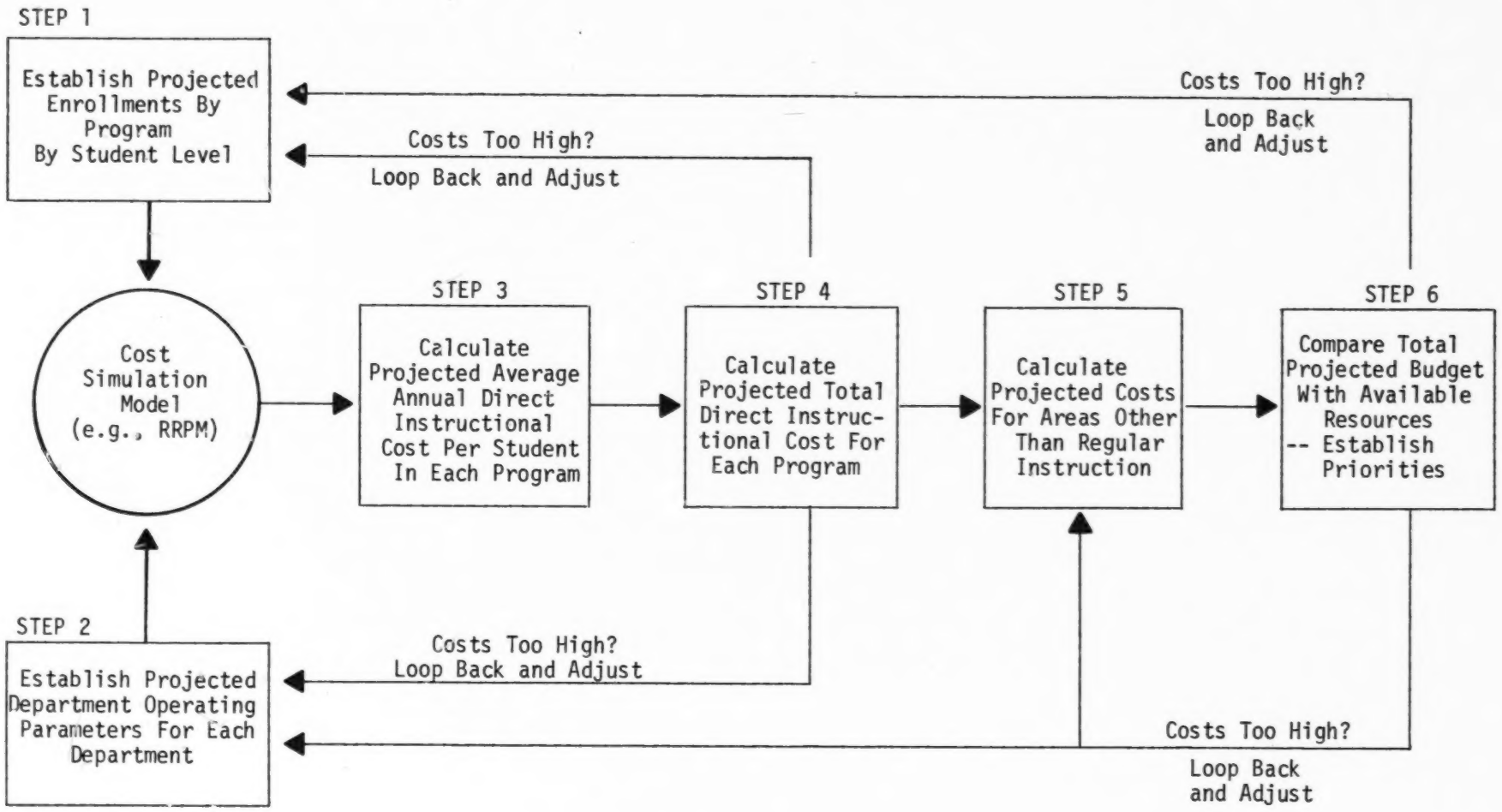
6. Levels in Support Activities
   - Increasing the per student expenditure for libraries
   - Decreasing the per student expenditure for counseling activities
   - Decreasing the per student support for intramural athletics

7. Long-Range Implications of Current Decisions
   - Establishing a new interdepartmental degree program in environmental studies
   - Moving towards degree program requirements which state only that a student must complete a given number of credit hours without regard to discipline or department
   - Increasing minority group enrollment by 300 students

8. Trend Analysis
   - Projecting staff salaries for ten years using salary increase figures from the past three years
   - Projecting student demand for physical science courses in light of the growing proportion of students enrolling in the fine arts program
   - Projecting the faculty rank mix in ten years if the trend of increasing proportions of senior faculty continues

By formulating instructional program budgets based upon various alternatives considered by an institution, it is possible to see, on a program-by-program basis, the impact of different institutional choices. When presenting instructional program budget information to funding agencies, it should be possible to have information readily available for presentation on the implications of different institutional alternatives.

PLANNING WITH AN INSTRUCTIONAL PROGRAM BUDGET


STEP 1
Establish Projected Enrollments By Program By Student Level
Costs Too High?
Loop Back and Adjust
Costs Too High?
Loop Back and Adjust
Cost Simulation Model (e.g., RRPM)
STEP 3
Calculate Projected Average Annual Direct Instructional Cost Per Student In Each Program
STEP 4
Calculate Projected Total Direct Instructional Cost For Each Program
STEP 5
Calculate Projected Costs For Areas Other Than Regular Instruction
STEP 6
Compare Total Projected Budget With Available Resources -- Establish Priorities
STEP 2
Establish Projected Department Operating Parameters For Each Department
Costs Too High?
Loop Back and Adjust
Costs Too High?
Loop Back and Adjust

PLANNING WITH AN INSTRUCTIONAL PROGRAM BUDGET

Planning with an instructional program budget may be seen as an iterative process. The first two steps in projecting an instructional program budget are (1) forecasting enrollments (broken down by program and level of student) and (2) describing how the various instructional departments will be operated. These data are then input to a cost simulation model as the basis for calculating the average annual cost per student in a program (Step 3). Once the average annual costs have been calculated, the total direct instructional program costs can be calculated as a function of the number of students and the average annual cost per student (Step 4).

When using a program budget for funding negotiations with statewide agencies or when planning for internal resource allocation, institutions would typically focus first on the mix of students and upon the types of programs offered. If the projected total instructional program costs exceed the available resources, they may be reduced either by decreasing the enrollment and hence the number of faculty and other resources required, and/or by adjusting the departmental parameters, such as faculty workload, salary scales, etc. The instructional program budget approach can assist in indicating where program adjustments compatible with institutional objectives and constraints may be made.

Once the direct instructional program costs have been established, the levels of support for other activities--including research, public service, and support programs--must be specified (Step 5). In many cases the planning process will focus concurrently upon the instructional programs and upon the support activities at the institution.

Planning with a program budget requires that priorities be established within the institution, so that in cases where resources are insufficient to fund all programs at the desired level, appropriate, feasible choices can be made (Step 6). Without such priorities, it becomes difficult to plan meaningfully in terms of programs. Rather, the tendency will be to make budgetary adjustments in those organizational units where cuts are least difficult or painful. Too often insufficient attention is given to the consequences such adjustments will have relative to the qualitative and quantitative outcome objectives of the institution.

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART I)

Instructional Programs	Student Enrollments		Average Annual Cost Per Student (Rounded to Nearest Dollar)		Total Direct Instructional Cost	
	Current	Projected	Current	Projected	Current	Projected
History						
Lower Division	143	157	$ 779	$ 772	$111,327	$121,409
Upper Division	186	195	1,127	1,115	209,656	217,843
Graduate Division	52	49	1,704	2,006	88,619	99,079
TOTAL	381	401			$409,602	$438,331
Biology						
Lower Division	121	133	$1,168	$1,155	$141,340	$153,688
Upper Division	94	98	1,958	2,046	184,041	201,899
Graduate Division	45	42	3,155	3,569	141,974	152,595
TOTAL	260	273			$467,355	$508,182
Fine Arts						
Lower Division	85	93	$ 987	$ 953	$ 83,918	$ 89,066
Upper Division	61	64	1,451	1,418	88,487	90,821
Graduate Division	17	16	2,532	2,375	43,048	38,361
TOTAL	163	173			$215,453	$218,248
Business						
Lower Division	180	198	$ 853	$ 850	$153,619	$168,211
Upper Division	306	216	1,466	1,572	301,973	339,922
Graduate Division	124	117	1,851	2,242	229,510	264,084
TOTAL	510	531			$685,102	$772,217
TOTAL	1,314	1,378			$1,777,512	$1,936,978

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART I)

The instructional program budget shown here is representative of the current conception and use of the term at NCHEMS. Simply stated, program costs are a function of the number of students enrolled in a program and the average annual cost per student in that program.

The term "total direct instructional cost" is used to distinquish between full costs and direct instructional or department costs where only departmental costs have been distributed to the programs. No indirect costs for such activities as libraries and physical plants have been included in the program costs shown here.

Perhaps the most important figure in an instructional program budget is the average annual cost per student, for it is that figure that indicates the dollar cost of a typical student in a given program. The average annual cost per student is calculated by summing the number of credit hours a student takes in each department multiplied by the cost per credit hour in the respective instructional departments. For example, the average cost per lower division history student may be broken down as follows:

Department & Course Level	Semester Credit Hours	Cost Per Credit Hour	Total Departmental Contribution
Lower Division History	12	$19.01	$228.12
Lower Division Biology	4	$34.35	$137.40
Lower Division Fine Arts	4	$34.71	$138.84
Lower Division Business	6	$20.90	$125.40
Upper Division History	4	$37.20	$148.80
			$778.56

In order to understand and justify the average annual cost per student, one must consider a series of reports containing the data on how instructional departments operate. These are described in the following pages.

The number of student levels identified as separate program cost centers will vary depending upon the nature of the institution and the data available. Three student levels are shown in this example. In

most two-year institutions a distinction is not made between first-year and second-year students, and it would not be necessary, therefore, to have multiple student levels for each program.

The use of current and projected figures throughout the instructional program budget provides a basis for comparing alternatives with the present level of operation. Generally, one would want to present current financial data and use that information as the point of departure for future planning.

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)

Instructional Department Operating Information

Summary Report

Department	DEPARTMENT CHAIRMEN Full-Time Equivalent Current	DEPARTMENT CHAIRMEN Full-Time Equivalent Projected	DEPARTMENT CHAIRMEN Total Salaries Current	DEPARTMENT CHAIRMEN Total Salaries Projected	TEACHING FACULTY Full-Time Equivalent Current	TEACHING FACULTY Full-Time Equivalent Projected	TEACHING FACULTY Total Salaries Current	TEACHING FACULTY Total Salaries Projected
History	1.00	1.00	$20,500	$21,500	24.50	25.50	$328,587	$352,941
Biology	1.00	1.00	24,000	25,000	32.50	34.00	471,365	501,754
Fine Arts	1.00	1.00	20,500	21,500	20.50	18.50	279,278	275,050
Business	1.00	1.00	22,500	24,000	29.00	31.50	396,392	467,515
TOTAL	4.00	4.00	$87,500	$92,000	106.50	109.50	$1,475,622	$1,597,260

Department	OTHER STAFF Full-Time Equivalent Current	OTHER STAFF Full-Time Equivalent Projected	OTHER STAFF Total Salaries Current	OTHER STAFF Total Salaries Projected	OTHER COSTS Current	OTHER COSTS Projected	TOTALS FTE Faculty/Staff Current	TOTALS FTE Faculty/Staff Projected	TOTALS Costs Current	TOTALS Costs Projected
History	6.00	7.25	$35,733	$46,047	$12,440	$13,826	31.50	33.75	$397,260	$434,314
Biology	8.00	8.50	59,629	68,847	19,357	20,610	41.50	43.50	574,351	616,211
Fine Arts	4.00	4.00	24,935	26,378	16,423	16,977	25.50	23.50	341,136	339,905
Business	5.00	6.00	32,888	40,483	12,985	14,550	35.00	38.50	464,765	546,548
TOTAL	23.00	25.75	$153,185	$181,755	$61,205	$65,963	133.50	139.25	$1,777,512	$1,936,978

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)

INTRODUCTION

The instructional program budget shown on page 22 is based upon a series of departmental planning parameter assumptions that describe how an institution operates its departments. Once the total number of credit hours a department must produce is known and once the departmental planning parameters are given, the cost per credit hour can be calculated. The following reports display the departmental data that form the basis of the program budget. These data are an integral part of an instructional program budget, for they indicate the resources that go into the instructional departments and from there flow along with credit hours to program cost centers.

The level of detail of information on departmental operations will vary depending upon the recipient and the use to be made of the information. For illustrative purposes, several reports are shown here, all of which can be prepared when using the NCHEMS RRPM 1.6. The number and titles of categories shown for departmental expenditures on faculty, staff, and other items may, of course, be specified by each institution to reflect unique situations and reporting practices. Additional or altered reports would undoubtedly be desired by many institutions.

INSTRUCTIONAL DEPARTMENT OPERATING INFORMATION

SUMMARY REPORT

On page 26 is a summary of the departmental planning parameters described in greater detail on the following pages. Notice that figures have been provided for both the current period and for a projected period. Also note that the total of the summary report dollars is the same as the total on Part I of the Program Budget Report.

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)

Instructional Department Operating Information

Productivity Ratios (Semester Credit Hours/FTE Faculty)

Department	Lower Division Instruction		Upper Division Instruction		Graduate Division Instruction	
	Current	Projected	Current	Projected	Current	Projected
History	720	790	444	444	248	222
Biology	434	478	230	226	120	108
Fine Arts	444	506	326	380	136	164
Business	678	746	576	522	282	254

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)
INSTRUCTIONAL DEPARTMENT OPERATING INFORMATION

PRODUCTIVITY RATIOS

The greatest single institutional and departmental cost is usually faculty salaries. The faculty productivity ratios specify the average number of semester credit hours produced by a full-time equivalent faculty member teaching exclusively at a given level of instruction. Thus, the average member of the history department instructional faculty would generate 720 credit hours if he were teaching only lower division courses in the current year, 444 credit hours if he were teaching upper division courses, or 248 credit hours if teaching only at the graduate level.

The figures here indicate considerable variation in faculty productivity among various departments and among course levels. The productivity ratios, more than any other number, indicate the actual outputs of the faculty within an instructional department.

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)

Instructional Department Operating Information

Cost Per Semester Credit Hour

(Rounded to Nearest Dollar)

Department	Lower Division Instruction		Upper Division Instruction		Graduate Division Instruction	
	Current	Projected	Current	Projected	Current	Projected
History	$19	$20	$37	$38	$77	$94
Biology	34	31	81	84	159	182
Fine Arts	34	33	52	50	140	130
Business	21	21	29	31	60	75

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)
INSTRUCTIONAL DEPARTMENT OPERATING INFORMATION

COST PER SEMESTER CREDIT HOUR

Given a series of departmental planning parameters and the number of credit hours by level of instruction that a department must generate, it is possible to calculate the cost per credit hour by course level. The table above displays that information.

As noted in the preceding pages, the average annual cost per student in each program is the sum of the cost per credit hour times the respective number of credit hours taken in each department by the average student in that program.

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)

Instructional Department Operating Information

Teaching Faculty Rank Distribution and Average FTE Salaries by Rank

Department	PROFESSORS						ASSOCIATE PROFESSORS					
	Percent of Faculty		Full-Time Equivalent		Average Salary		Percent of Faculty		Full-Time Equivalent		Average Salary	
	Current	Projected	Current	Projected	Current	Projected	Current	Projected	Current	Projected	Current	Projected
History	24.5%	23.5%	6.00	6.00	$17,940	$18,441	28.7%	27.5%	7.00	7.00	$15,568	$16,000
Biology	24.6%	23.5%	8.00	8.00	18,500	19,047	33.9%	30.9%	11.00	10.50	15,869	16,455
Fine Arts	24.4%	27.0%	5.00	5.00	17,606	18,287	34.1%	32.5%	7.00	6.00	14,872	15,706
Business	24.1%	22.2%	7.00	7.00	18,006	18,429	27.6%	31.8%	8.00	10.00	15,019	15,419

Department	ASSISTANT PROFESSORS						INSTRUCTORS					
	Percent of Faculty		Full-Time Equivalent		Average Salary		Percent of Faculty		Full-Time Equivalent		Average Salary	
	Current	Projected	Current	Projected	Current	Projected	Current	Projected	Current	Projected	Current	Projected
History	22.4%	25.5%	5.50	6.50	$11,437	$11,779	12.2%	11.8%	3.00	3.00	$ 9,532	$ 9,933
Biology	27.7%	29.4%	9.00	10.00	12,971	13,365	1.5%	4.4%	.50	1.50	9,000	9,500
Fine Arts	24.4%	21.6%	5.00	4.00	11,570	12,128	12.2%	8.1%	2.50	1.50	9,000	9,638
Business	34.6%	23.8%	10.00	7.50	11,620	12,597	10.3%	12.7%	3.00	4.00	9,057	9,714

Department	TEACHING ASSISTANTS						OTHER					
	Percent of Faculty		Full-Time Equivalent		Average Salary		Percent of Faculty		Full-Time Equivalent		Average Salary	
	Current	Projected	Current	Projected	Current	Projected	Current	Projected	Current	Projected	Current	Projected
History	12.2%	7.8%	3.00	2.00	$ 6,800	$ 7,200		3.9%		1.00		$ 9,360
Biology	12.3%	11.8%	4.00	4.00	6,800	7,200						
Fine Arts	4.9%	5.4%	1.00	1.00	6,800	7,200		5.4%		1.00		19,200
Business	3.4%	3.2%	1.00	1.00	6,800	7,200		6.3%		2.00		22,034

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)
INSTRUCTIONAL DEPARTMENT OPERATING INFORMATION

TEACHING FACULTY RANK DISTRIBUTION AND AVERAGE SALARY BY RANK

The largest single object of expenditure in any instructional department is usually teaching faculty salaries. Therefore, the distribution of faculty by rank and their average salary becomes a very important planning parameter within an institution. Shown on page 32 are the data, both current and projected, related to the proportion of faculty at each rank, the number of faculty, and their average salaries.

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)

Total FTE Teaching Faculty and Salaries by Rank
(All Departments)

Faculty Rank	Percent of Faculty		FTE Faculty		Total Faculty Salaries	
	Current	Projected	Current	Projected	Current	Projected
Professors	24.4%	23.7%	26.00	26.00	$469,582	$483,264
Assoc. Professors	30.9%	30.6%	33.00	33.50	507,981	533,203
Asst. Professors	27.7%	25.6%	29.50	28.00	353,892	353,203
Instructors	8.5%	9.1%	9.00	10.00	82,967	97,362
Teaching Assts.	8.5%	7.3%	9.00	8.00	61,200	57,600
Other		3.7%		4.00		72,628
TOTAL	100.0%	100.0%	106.50	109.50	$1,475,622	$1,597,260

INSTRUCTIONAL BUDGET FORMAT (PART II)

TOTAL FTE TEACHING FACULTY AND SALARIES BY RANK

The report shown here is a summary of teaching faculty for the entire institution. It indicates the proportion, number, and total salaries for each academic rank.

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)

Instructional Department Operating Information

FTE Support Staff and Average Salaries by Category

	ADMINISTRATIVE ASSISTANT				SECRETARIES			
	Full-Time Equivalent		Average Salary		Full-Time Equivalent		Average Salary	
Department	Current	Projected	Current	Projected	Current	Projected	Current	Projected
History	1.00	1.00	$8,451	$9,011	3.00	4.00	$5,780	$6,167
Biology	1.00	1.00	9,158	9,695	2.00	2.00	6,196	6,585
Fine Arts	1.00	1.00	8,726	9,244	1.00	2.00	6,031	6,016
Business	1.00	1.00	9,296	9,862	2.00	2.00	6,411	6,837

	CLERK TYPISTS				LAB TECHNICIAN & RESEARCH ASSISTANTS			
	Full-Time Equivalent		Average Salary		Full-Time Equivalent		Average Salary	
Department	Current	Projected	Current	Projected	Current	Projected	Current	Projected
History	2.00	2.00	$4,971	$5,384		.25		$6,400
Biology	1.00	.50	4,919	4,824	4.00	5.00	$8,290	8,714
Fine Arts	2.00	1.00	5,089	5,102				
Business	2.00	3.00	5,385	5,649				

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)
INSTRUCTIONAL DEPARTMENT OPERATING INFORMATION

FTE SUPPORT STAFF AND AVERAGE SALARIES BY CATEGORY

In addition to the department chairmen and the teaching faculty, instructional departments typically have one or more categories of non-academic staff. Page 36 indicates the number of FTE staff and their associated salaries by category.

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)

Total FTE Support Staff and Salaries by Category
(All Departments)

Support Staff Category	Percent Of Support Staff		FTE Support Staff		Total Support Staff Salaries	
	Current	Projected	Current	Projected	Current	Projected
Administrative Assistants	17.4%	15.5%	4.00	4.00	$ 35,631	$ 37,812
Secretaries	34.8%	38.9%	8.00	10.00	48,585	63,544
Clerk Typists	30.4%	25.2%	7.00	6.50	35,809	35,229
Lab Technician/ Research Asst.	17.4%	20.4%	4.00	5.25	33,160	45,170
TOTAL	100.0%	100.0%	23.00	25.75	$153,185	$181,755

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)

TOTAL FTE SUPPORT STAFF AND SALARIES BY CATEGORY

This report is a summary of all instructional department staff other than regular teaching faculty and department chairmen. It indicates the distribution of support staff across the different categories, the total number of FTE support staff by category, and their associated salaries for the entire institution.

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)

Instructional Department Operating Information

Other Departmental Costs by Type

Department	Equipment		Supplies		Printing		Travel		Miscellaneous	
	Current	Projected	Current	Projected	Current	Projected	Current	Projected	Current	Projected
History	$ 2,864	$ 3,164	$ 4,428	$ 4,794	$ 2,574	$ 2,933	$ 1,716	$ 1,955	$ 858	$ 980
Biology	4,609	5,033	7,232	8,023	2,505	2,517	3,758	3,776	1,253	1,261
Fine Arts	3,974	3,986	7,808	8,007	2,320	2,492	1,547	1,661	774	831
Business	2,985	3,176	2,889	3,259	3,555	4,056	2,802	3,244	754	815
TOTAL	$14,432	$15,359	$22,357	$24,083	$10,954	$11,998	$ 9,823	$10,636	$ 3,639	$ 3,887

INSTRUCTIONAL PROGRAM BUDGET FORMAT (PART II)
INSTRUCTIONAL DEPARTMENT OPERATING INFORMATION

OTHER DEPARTMENTAL COSTS BY TYPE

The report displayed here itemizes the nonsalary expenditures for the instructional departments. The objects of expenditures shown here are typical of the categories used in many institutions.

ESTIMATING EXPENSES FOR AREAS OTHER THAN REGULAR INSTRUCTION

Basic Estimating Equation:

$$\$ \text{ Budgeted} = K\$ \pm (b_1\$ \times \text{Enrollment}) \pm (b_2\$ \times \text{FTE Faculty}) \pm (b_3\$ \times \text{FTE Chairman}) \pm (b_4\$ \times \text{Student Credit Hour}) \pm (b_5\% \times \text{Faculty Salaries}) \pm (b_6\% \times \text{Staff Salaries}) \pm (b_7\% \times \text{Instructional Budget})$$

Examples:

Libraries Budget = $52,000 + ($2.00 x Student Credit Hours) + ($100 x FTE Teaching Faculty)

Audio/Visual Services Budget = $36,000 + ($3.00 x Enrollment) + ($10.00 x FTE Faculty) + (.01 x Instructional Budget)

Executive Management = $171,000

ESTIMATING EXPENSES FOR AREAS OTHER THAN REGULAR INSTRUCTION

The cost simulation models developed at NCHEMS focus primarily on the regular instructional programs. The concept of a program budget discussed thus far has dealt solely with instructional departments and the instructional programs they support. Nothing has been said of estimating expenditures in such other areas as libraries and physical plant.

Expenses for those activities outside the regular instructional programs are calculated through the use of the basic estimating equation shown above. The constant (K) and/or any of the variables indicated may be used to estimate any cost occuring outside the instructional departments. If authorized state funding formulas exist for various support activities, they may be used in the NCHEMS RRPM as the estimating equations for noninstructional activities.

APPENDIX

ADDITIONAL COMMENTS ON THE RELATIONSHIPS BETWEEN INSTRUCTIONAL DEPARTMENTS AND PROGRAMS

As indicated in the introduction, a "program" identifies a series of activities and resources contributing to the education of a group of students pursuing a common curricular path. This definition of the term "program" goes considerably beyond the activities of a single instructional department, for it implies that many instructional departments may contribute to a specific program. Moreover, this use of the term is not limited to a group of students pursuing any specific degree, but rather suggests only that several students might logically be viewed as a homogeneous group for analytical purposes. Hence, some of the titles that might be used to identify students in specific programs would include:

-- Student Major
-- Degree Program
-- Nondegree Program
-- Vocational Program
-- Field of Study
-- Field of Interest
-- Curricular Path

The manner in which students are classified under one title or another would depend, of course, upon institutional characteristics and the data available for analysis. For example, if students declare their majors at the beginning of each term, it would be possible to classify them in accordance with the majors that they indicate at registration. However, some students enrolled within the institution may not actually have a student major, per se.

Many evening programs at two-year and four-year institutions are not intended as part of a curriculum leading to a specific degree. In such cases, it might be appropriate to have a program category that would simply include those students taking evening courses for their own personal reasons. At the same time, however, some students who are enrolled in specific degree programs may be taking those same evening courses, in which case the evening courses may be seen as contributing to specific degree programs while also contributing to the program of "general evening education."

Throughout the examples shown on the previous pages, four departments with corresponding majors have been used. In reality, what has been called an instructional department for illustrative purposes in this booklet might be any cost center that can be identified and isolated within the institution. The organizational unit contributing to specific instructional programs might be a discipline within a department, a department, a division comprising several departments, or even a school or college. Clearly, the level of aggregation chosen for these instructional units will depend upon the data available and upon the use to be made of the instructional program budget.

In all the preceding examples, a department in the same area of study corresponded with each program. Most colleges and universities have some programs for which there is no corresponding instructional department; and, conversely, many have service departments that do not have corresponding degree programs. Thus, a new interdisciplinary program in environmental studies might draw only upon existing instructional departments. Similarly, a physical education department might provide instruction to students in all programs, but not support a physical education program. This distinction between programs on the one hand and instructional activities on the other is often a source of confusion in discussions of the concepts of instructional program budgeting. The important distinction to be made is that instructional departments, which are organizational units, are seen as the providers of the activities to students enrolled in various programs. A program, then, consists of all the activities and resources contributing to the educational experience of a particular group of students.

SOME ADDITIONAL CONSIDERATIONS RELATING TO DEPARTMENTAL OUTPUTS

Departmental output, in the previous examples, has been described in terms of credit hours produced. Moreover, the dollar resources from organizational units have been allowed to flow to programs in proportion to the flow of credit hours from specific instructional departments to programs. The approach to instructional program budgeting illustrated here is sometimes criticized because resources from instructional departments are allowed to flow into programs in

proportion to the flow of credit hours. Credit hours are a useful measure of a student's progress toward some educational objective. It should be noted, however, that other measures of instructional department outcomes may be more appropriate to meaningful program cost analysis at a specific institution.

TIME PERIOD CONSIDERATIONS IN INSTRUCTIONAL PROGRAM BUDGETING

While the average annual cost per student is the most common figure prepared in instructional program budgeting, the use of other time periods for program cost analysis may be desirable in some instances. For example, analysis might reveal that the cost per student varies significantly between the fall and spring semesters at a given institution. If funding formulas are based upon actual enrollments in each semester, it may be desirable to generate program cost information that would give the average semester cost per student by program.

CONSIDERATIONS IN DEFINING STUDENT LEVELS

Institutional characteristics and the purposes of instructional program budgeting will determine the number and type of student levels to be used. In the examples shown here, three student levels have been used--lower division, upper division, and graduate division. The Resource Requirements Prediction Model 1.6 will accommodate up to seven different student levels. Hence, it would be possible to have categories including:

-- Freshman
-- Sophomore
-- Junior
-- Senior
-- Master's
-- Ph.D.-1
-- Ph.D.-2

Many two-year colleges have indicated little need for differentiation among the student levels in those kinds

of institutions. However, some two-year institutions have used different student levels to identify different major groupings of students; e.g., degree programs and transfer students, vocational students, and evening students. The use of different student level categories will depend largely upon institutional data available for instructional program budget preparation.

CONSIDERATIONS IN DEFINING INSTRUCTION (COURSE) LEVELS

Throughout this booklet three instructional levels have been used--lower division, upper division, and graduate division. As with student levels, RRPM 1.6 will allow the user to specify up to seven different course levels. The same considerations described in the previous paragraph apply to the selection of course levels within each department for instructional program budgeting.

CONSIDERATIONS IN DEFINING "STUDENTS" FOR ANALYTICAL PURPOSES

No consideration has been given in this document to the definition of a student. Cost per student information has been presented, but no reference has been made to how a student is defined. Two approaches may be taken. The first is simply to calculate the cost per headcount student; i.e., for each student entering the institution, irrespective of whether or not he is taking a full-time academic load. Alternatively, the institution may choose to convert the number of headcount students in each program to standard FTE students. This is calculated by dividing the number of hours taken by a full-time equivalent student into the total number of credit hours taken by all headcount students in a specific program. The method chosen will depend upon the use to be made of the instructional program budget information.

SOME ADDITIONAL CONCERNS ABOUT THE USE OF INSTRUCTIONAL PROGRAM BUDGET INFORMATION IN HIGHER EDUCATION

Some of the potential users of instructional program budget information have expressed reservations about the centralizing tendency that program budgeting may induce upon an institution. They argue that the decision-making responsibility and authority may be removed from the department head and the dean and vested in a central institutional planning office. In

the extreme case, there is certainly good cause for these concerns, for if resources are allocated to instructional departments strictly upon the basis of current or projected loads induced by a given mix of students, the program budget becomes the deterministic master of the institution.

However, an instructional program budget generated by a cost simulation model such as the Resource Requirements Prediction Model should not become a substitute for judgment and conscious, deliberate decisions. A more desirable approach to instructional program budgeting is to have the institution provide some overall guidelines to the various instructional departments regarding the number of credit hours that each department would probably need to provide in order to meet the needs of a given mix of students. Given that planning parameter, the departments would be asked to review their activities and prepare desirable or proposed budgets. That information would be collected and aggregated for comparison with revenue forecasts. Preliminary or proposed allocations could then be put forth for discussion with each instructional department. These preliminary allocations would be estimated in light of institutional constraints and priorities. In many cases, a cost simulation model would assist in providing such figures for discussion purposes. The departments would hopefully then be able to prepare a description of their proposed activities for the budgetary period in question, and these would again be aggregated and reviewed at a higher level.

The essential point is that instructional program budgeting is not unlike the budgeting process that currently exists in most institutions. It involves a good deal of two-way communication among various decision-making centers of the institution; and it will require, in many cases, several rounds of proposals and counterproposals before agreement is reached on the best or most acceptable distribution of the institution's resources.

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